Financial crisis, internationalization choices and Italian firm survival

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Abstract

In this paper we focus on the relationship between internationalization choices and survival of Italian firms during the financial crisis. Making use of a new database matching four firm-level datasets provided by the Italian National Statistical Institute (ISTAT), we build a detailed taxonomy of internationalization activities of Italian firms in 2007 and 2010, before and after the financial crisis. Descriptive analyses confirm that firms adopting more complex forms of internationalization (e.g. offshoring, or exporting worldwide) are more efficient and export a wider range of goods than traditional exporters. Indeed, over the period 2007-2010, Italian firms moved (on average) towards more complex forms of internationalization. We found that these upward" changes are associated to positive employment and value added dynamics firm level. Furthermore, the more increases the firms' position in international trade, the greater is their likelihood to survive. Empirical findings are provided by estimating a conditional survival model for each class of internationalization, controlling for both firm level labor productivity and firm and industry level specific covariates. Multinational firms (at the top of our taxonomy) show lower resilience during the crisis with respect to "global" or "two-way traders". These findings put additional emphasis on the issue of the diversification of both products and markets as a goal to be pursued by firms even in times of crisis, as the current ones to remain competitive, make profits and survive.

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1. Introduction.

In the first decade of the twenty-first century, the reduction of trade barriers and the participation of East Asian economies to international trade led to an increase of competitiveness in the international markets. The growing demand from emerging markets was a key factor in supporting the overall economic growth in almost all European countries. Following the sharp fall in 2009, the recovery of international trade largely benefited those countries most ready to exploit opportunities provided by the external demand, in a framework where domestic demand was sluggish or decreasing. The issue of the faster growth of the firms characterized by an advanced degree of internationalization comes up again, especially in the current phase, as competitiveness is now considered a key factor for the adjustment in the euro area (Altomonte et al., 2012).

The economic literature highlighted the existence of a positive relationship between competitiveness and the degree of internationalization at the firm level. Better firm performance, in term of productivity and profitability, is usually associated, on average, to a more "complex" internationalization policy. Moving towards most advanced forms of internationalization could therefore strengthen firm competitiveness and, ultimately, countries' economic growth potential. This aspect seems further more relevant during a recession, as the international activity could in fact improve the probability of firm survival.

The aim of this paper is to investigate the relationship between firms' internationalization choices, its performance and survival possibilities. To this aim, we use an innovative database resulting from the integration of both statistical surveys and administrative data on Italian enterprises. The dataset refers to two non-consecutive years (2007 and 2010), which corresponds to the periods, respectively, before and after the first tough of the recent global financial crisis. It includes observations for over 90,000 Italian internationalized companies. Using the wide range of information of this dataset, we build a detailed taxonomy of the internationalization characteristics for the Italian firms, according to the degree of engagement in external trade activities. First, we present the structural characteristics of Italian firms for each of the classes we have identified. Second, in the empirical analysis, we look at the determinants of firms' survival during the Great Recession. The aim of the investigation is twofold and concerns *a*) the relations between the adoption of a given internationalization form and the chance of firm survival; *b*)the extent to which differences in the internationalization strategies corresponds to statistically significantly differences in the probabilities of survival ("survival premia"). To this aim, we estimate a conditional survival model where the probability of firm survival is modeled as a function of both firm-level labor productivity and of a wide set of firm- and sector-level characteristics.

The paper is organized as follow. The next section reviews the main theoretical and empirical contributions on the issue of internationalization choices, productivity and firm survival. A description of the dataset is presented in Section 3. Some descriptive evidence on performance of Italian firms during the crisis is discussed in Section 4. In Section 5 the econometric strategy and the empirical results are presented and commented. Section 6 contains some final remarks.

2. Literature review

In the last decade, the theoretical and empirical literature on international trade and firm performance developed very rapidly. In particular, the topic of productivity gained a prominent position. This is due, on the one hand, to the central role played by firm-level productivity in a

couple of very influential theoretical works; on the other hand, to the growing availability of firm-level dataset.

On the theoretical ground, in their influential paper Bernard and Jensen (1995) document a significant exporter productivity premium in US manufacturing industries (i.e. exporters are more productive that non-exporting firms of the same size from the same narrowly defined industry). Indeed, differences in firms productivity are at the heart of the theoretical models developed by the seminal paper of Melitz (2003) in the following decade (Melitz and Ottaviano 2008, Chaney 2008, Bernard et al. 2011), according to which only more productive firms can cover entry costs (sunk costs) to sell abroad and produce profitably.

These models focus on the export behavior of firms and shoved more and more scholars to micro-level investigations of this topic. Despite the study of productivity has been a core topic in economics for a long time, empirical investigations on the determinants and consequences of firm-level productivity differentials are of a more recent vintage due to the growing availability of suitable datasets.

Several micro-econometric empirical studies developed in latest years focused on the determinants of efficiency differential between exporters and non-exporters. Specifically, the self-selection (foreign markets entry costs represent a barrier that less productive firms are not able to overcome) and the learning-by-exporting hypothesis (knowledge flows from international buyers and competitors help to improve the post-entry performance of export starters) have been widely investigated. Along the same lines, the relationship between importing and productivity recalls both arguments, the a positive impact of productivity on importing (self-selection hypothesis: there are sunk costs of importing due to the learning and acquisition of customs procedures) and the positive effect of importing on productivity (learning-by-importing: importing intermediate or capital goods makes a firm more productive by enabling it to access to higher quality inputs and/or to extract technology embodied in imported goods, see, among most recent, Castellani et al. 2010, Altomonte and Békés 2010, Muuls and Pisu 2009). Indeed, a large body of works, taking advantage of the richness of information contained in new available datasets, focused on the differences in productivity between firms involved with different degree in international trade, distinguishing firms as only exporters, only importers, two-way traders (both importing and exporting at the same time) and firms operating only in the domestic market.

Common findings from this literature are the following. First, two-way traders are the most productive group of firms, followed by only importers and exporters, while firms operating only in the domestic market come last (see Wagner 2011a for a detailed survey). In some cases, the availability of firm-level data on foreign direct investment allows for the inclusion of multinational firms as a more complex category of internationalization, (i.e. firms that have a foreign participation or that are controlled by a foreign owner, see Altomonte et alii 2012). This latter group is usually at the top of the productivity ranking. Second, an evidence of self-selection seems to emerge: only the firms showing higher productivity levels in the years before starting to export can afford fixed entry costs of selling abroad. Third, firms of different countries show common features as regards their structural characteristics: internationally active firms are usually bigger (in terms of size, proxied by number of employees), show higher turnovers, larger capital stock and sell more varieties of goods with respect to both domestic firms and enterprises which adopt less complex form of internationalization.

More recently, in addition to the relationship between trade and productivity, also other aspects of firm's performance were investigated: the link between export activity and wage (exporters pay

higher wage with respect to non-exporters), export and profitability (exporter firms are more profitable than non-exporters), international trade activity and firm survival (exporters have a higher probability to survive, see Wagner 2011b for a detailed survey).

This latter aspect seems of great interest when we analyze the behavior of exporting firms in a period characterized by a deep recession followed by a temporary recovery, a business cycle phase entirely included in the time span of our dataset (2007-2010). From a theoretical point of view, there are ambiguous predictions on the probability of exporting or importing firm survival to an economic crisis. On the one hand, we would expect a positive relationship between internationalization and firm survival. In fact, export activity can be considered as a form of risk diversification: when business cycle conditions in the domestic market are difficult, foreign demand can provide a chance to continue to produce, sell and make profits if business cycle conditions abroad are better than in the domestic market. Ceteris paribus, exporting firms should improve their survival probability with respect to non-exporters. On the other hand, exporting firms' production is characterized by economies of scale due to the presence of higher sunk costs to sell abroad; furthermore, firms are more dependent on credit and bank lending with respect to non-exporting firms. These two facts could make exporting firms less flexible in adapting to changes in the business cycle and more vulnerable to a rise in interest rates, thus dampening their probability of survival.

The relationship between internationalization activity (export and/or import) and firm survival is widely investigated in the empirical literature. The majority of contributions focuses on the survival of the domestic market firms. To the best of our knowledge, recent case studies are discussed for Canada (Baldwin and Yan, 2011), Denmark (Eriksson et alii, 2009), Japan (Kimura et Kiyota, 2006), Spain (Esteve-Perez et alii, 2008), Sweden (Greenaway et alii, 2008 and 2009).

Ferragina et alii (2012) have investigated this topic for the Italian case. The authors analyze the determinants of Italian firms survival according to their ownership status (foreign and domestic multinationals vs. domestic non-multinationals). The analysis is carried out over the period 2004-2008, thus not including the effects of global financial crisis. Controlling for several firm- and industry- specific characteristics, the authors find that foreign multinationals are more likely to exit the market than national firms in the manufacturing sector. By contrast, domestic multinationals in the services sector reveal a higher probability to survive with respect to other firms' categories. Amendola et alii (2012) consider a longer time period (2002-2010), which also includes the years of financial crisis. Common to other studies, firms are classified depending on their involvement in international activity (exporters, foreign affiliate or investing abroad). Using a model of the firm's survival prospects, the authors estimate the probability of "failure" of a firm before 2008 and during the crisis (2008-2010) as a function of firm international engagement, controlling for a wide set of firm-level and sectoral characteristics. According to the results, during the crisis exporting firms showed a lower probability to exit the market compared to non-exporters, while domestic and foreign multinational firms displayed an exit pattern not significantly different from that of national firms. These evidences seem to support the existence of a positive "exporting effect" and the lack of a "multinational effect" on the probability of firm exit during economic crises.

Our work is placed in the wake of the work of Amedola et alii (2012). Our aim is to analyze to what extent the probability of firm's exit from the market is related to its own form of internationalization. The main differences with respect to the Amendola et alii's study are basically twofold: *a)* our database considers a wider range of forms of internationalization; *b)* our databases (and our analysis) includes only firms operating internationally, either on a trade or productive base.

3. Dataset description

The focus of our analysis is to evaluate the relationship between Italian firms' internationalization and their probability to exit the market during the period of financial crisis. The main structural features of firms, their exporting performance and their involvement in international trade need to be considered. Since all this information is not available using a single data source, our dataset is obtained through the integration of four firm-level datasets provided by the Italian National Institute of Statistics (ISTAT).

First of all, the reference statistical source is given by the ISTAT structural business statistics surveys (SBS), providing information on firms' structure (value of production, turnover, operating costs, wage and salary, value added, tangible and intangible fixed assets). Currently, they include all the companies with at least 100 employees (so called SCI survey) and a large "rotating" sample of firms with no more than 100 employees (PMI). PMI datasets essentially includes the variables appearing in the firm's Income statement but not those from the balance sheet statement.

Firm-level trade data are drawn from custom trade statistics (COE). COE is a census type statistics (based on administrative data) and represents an harmonized source about imports, exports and trade balance. It collects information on firms operating in Italy and tracks the value and quantity of goods traded by Italian firms with both EU (intra-EU trade) and non-EU operators (extra-EU trade). Specifically, for each firm and time period, COE contains information on the value and the volume of goods traded (exported and imported) by each pair of product/destination market.

We manage this information as follows. First, origin/destination markets are grouped into 11 geographical areas[1]. Second, export/import flows by firm/destinations/origin are aggregated with respect to firm's scope, so that only the information on the number of products by firm/destination/origin market is retained[2]. Overall, the revised structure of COE dataset is as follows: i) firm-level exports/imports towards/from 11 specific destination/origin area are available; ii) the number of product exported is provided for each pair of firm/destination markets.

Information about multinational firms is provided by FATS database, that reports statistical information on both the foreign-controlled enterprises operating in Italy (inward FATS statistics) and Italian non-resident foreign affiliates (outward FATS statistics). It is worth to notice that, merging FATS and COE datasets, we include in our dataset only multinational firms located within national boundaries, i.e., Italian firms with foreign affiliates and foreign-owned branch operating in Italy.

The firm-level matching of the information contained in the above statistical sources is achieved using the ISTAT Business Register (BR), that present a unique association between the ISTAT "company code" and firm's VAT code[3].

Furthermore, the matching procedure drops out the subsample of companies operating exclusively in the domestic market. It follows that our database consists of a sample of exporting firms (both in

[1] The world market is divided into eleven areas: European Union 27; non-EU European countries, North Africa, other African countries, North America, Central and South America, Middle East, Central Asia, East Asia, Oceania, Other territories and destinations.

[2] The number of products is computed according to the 8-digit code of the Combined Nomenclature (CN), the classification system adopted in the COE database.

[3] A set of production units common to BR, SBS and COE databases is obtained as follows. Firstly, BR and COE databases are matched using the VAT code and using the unique pair of VAT-BR codes for each trader. Secondly, COE and SBS, are then matched using the BR code "company-code" as common information. It should be considered that the relation between SBS and COE is of the type one-to-many, since for each record in SBS (firm *i* in year *t*) it is possible to identify more than one correspondence in COE, due to the greater detail of export flows by both destination markets and product scale..

the manufacturing and services sectors) with several degrees of participation to the international trade.

The dataset used for the empirical analysis consists of matched firm-level information for two separate periods, 2007 and 2010, denoting, respectively, the beginning of the global financial crisis and a temporary recovery of the business cycle. For each year, it includes more than 90.000 statistical units. According to 2010 sample data, enterprises employed about 4.4 million workers and exported goods for about 293 billion of euros (over 85% of total Italian exports).

4. Italian firms and internationalization: some descriptive evidence

4.1 A taxonomy of internationalization of Italian firms

Building on the existing literature[4], we provide a taxonomy of internationalization strategies of Italian firms consisting in seven mutually exclusive classes, each indicating a different mode of operating in foreign markets. Five classes are related to the commercial internationalization, the other two are related to the internationalization of production.

Going from the basic type of international activity to the most complex one, the first class (“only exporter”) includes firms essentially exporting towards EU markets and/or up to four extra-EU areas (i.e. neither importing nor undertaking any kind of productive internationalization). Firms carrying on only import activity are considered in the second and third class distinguishing, respectively, those importing intermediate goods exclusively ("importers of intermediate goods’) and those importing all the other types of assets ("importers of other goods/services "). The fourth class includes firms that both import and export ("two-way traders"). Firms exporting to at least five extra-EU areas ("global") are considered in the fifth category. The last two classes refer to the internationalization of production. The Italian firms that have foreign subsidiaries ("MNE") are grouped in the sixth class, those controlled from abroad are associated to the seventh group ("foreign control"). For each year, each firm is assigned to a single class. If a firm has more than one characteristic among those selected for the assignment along the scale of internationalization, it is attributed to the higher class (e.g., if a firm is controlled from abroad, does not have import activity and only exports towards EU Member States, then it is allocated to the “foreign control” class).

On the basis of the taxonomy described above, in the next section we analyze the relationship between participation in foreign markets and the performance; moreover, we measure the effect of the changes occurred in the internationalization strategies between 2007 and 2010.

4.2 Internationalization and firm’s performance during the crisis

Different forms of internationalization are related to different performance. In 2010, the internationalized firms in our sample are mostly “two-way traders” (30.8%) and “only exporters” (26.4%), while most advanced forms of internationalization account for a very limited share of firms: the enterprises controlled by a foreign owner (“foreign control”) and the Italian MNEs represent 4.7% and 3.4% of the total, respectively. Both groups, however, show a larger average size in terms of employees: 206.6 and 219.8, respectively, compared to the significantly lower

[4] See for example Altomonte et alii (2012).

average size (13.4 employees) of “only exporters” (Table 1). Furthermore, the MNEs export a wider range of goods, while the “global” firms serve on average a larger number of markets (Table 2). It can also be noted that labor productivity – measured in terms of value added per employee – increases as we move from the simplest forms of internationalization to the most complex ones. The same evidence occurs also within size classes (cfr. Table 3). By contrast, the share of export turnover – a proxy for the firm’s degree of openness to the international activity – is higher for the global firms than for MNEs. In 2010, firms showing a more complex form of internationalization show higher levels of efficiency, as well as a more pronounced diversification of production, measured in terms of the variety of exported goods. At the same time, these companies are neither the most profitable, nor those with the greatest degree of openness in international trade. Finally, multinational production units (Italian or foreign) are a distinct minority.

The internationalization strategies of the Italian firms changed during the crisis, A first clue of these transformations can be assessed in terms of the movements between the internationalization classes as reported in the transition matrix (Table 4). The main diagonal indicates the persistence in the same internationalization class between 2007 and 2010, while the values below (above) this diagonal show the transitions towards less (more) complex categories. In particular, more than 57,000 firms are present in the sample both in 2007 and in 2010. Of these, about 70% do not change internationalization’s strategy between the two periods. The degree of persistence rises as we move towards the most advanced classes of the taxonomy.. Furthermore, also the changes of status are significant: 18.2% of the sample (about 10,500 firms) moved upwards between the two years, especially from the “only exporters” and “importers of intermediate goods” classes to “two-way traders” (about 3,300 and 2,000 units, respectively). On the contrary, about 7,000 firms (12.3% of the sample) shifted downwards, mostly from “global” to the “two-way trader” status. As a consequences, in the years of the “great recession”, the Italian internationalized firms accounted for a positive “net movement” towards more complex forms of presence in international markets.

Shifts and permanencies in the various classes of internationalization should be associated with different firms’ performance, measured in terms of employment dynamics and value added growth. To account for this this issue, we first regroup the seven classes of internationalization into four more aggregate groups on the basis of the average firm’s productivity: MNEs (including previous “MNEs” and “foreign control”), “global” (as the union of the “global” and “two-way trader” classes), “only importer” (as the union of “importer of intermediate goods” and “importer of other goods/services” classes), “only exporter”. Second, we estimated the model (1),

$$Y_i = \alpha_i X_i + \beta_{ij} Z_{ij} + \gamma_{ik} W_{ik} + \delta_{ir} Q_{ir} + \vartheta_{is} R_{is} + \varepsilon_i, \qquad (1)$$

where Y_i is the performance variable (respectively, the percentage change in employees and value added); X_i is the (logarithm of) the level of the corresponding dependent variable in 2007, Z_{ij} (j = 1…16) is set of dummy variables indicating changes or persistence in firm’s internalization form, W_{ik} (k = 1, 2) are two dummy variables indicating, respectively, whether firm *i*-th is medium- or large-sized; Q_{ir} (r = 1, 2, 3) indicates the location of the firm by NUTS1 Region (North-East, Centre, South); R_{is} (s = 1 … 42) are industry-specific dummy variables (Nace.Rev.2, 2-Digit).

The results are reported in table 5. Two main effects seems to emerge. Firstly, upwards shifts are associated with a positive and significant development of both measures of performance. Secondly, the larger the shift, the stronger is the effect in terms of firm’s performance. Small and medium sized firms appear well positioned in the scale of internationalization: in fact, a large number of companies of this type lie in the intermediate category of the two-way traders. We also argue that a sub-sample of firms moved towards more complex forms of internationalization over

the period 2007-2010 as a consequence of the implementation of strategies to contain the effects of the crisis. These upwards changes determined positive effects on both employment and value added growth.

Those findings may be considered as a first empirical insight on a positive relationship between the degree of participation in international trade and oveall firm's performance. A first suggestion is that, for a firm to keep showing a positive performance even during the harsh 2007-2010 period, progress towards more complex models of participation in international markets may be needed.

5. Firm survival and internationalization during the crisis

The findings on Italian firms discussed in the previous section confirm the existence of a relationship between internationalization modes and firm performance. Those evidences are obtained on the restricted sample of firms participating in international trade in both 2007 and 2010. Furthermore, a considerable number of firms operating in foreign markets in 2007 is not associated to any class of internationalization in 2010.

It seems of some interest to investigate the relationship between internationalization forms and firm survival. In particular, we want to tackle this issue: during the crisis, how and how much the internationalization form affected the chance of firm survival? It should be considered that it is not possible to properly discriminate the exiting companies according to whether they temporarily stopped their trade activities, or failed or entirely switched their activities to the domestic market. In what follows, we attribute the "disappearance" of each firm from the panel in 2010 to the effects of the financial crisis. We are aware that such assumption might be somewhat arbitrary, as we do not have enough information to monitor the reasons underlying the exit of each enterprise from the sample panel. We can therefore consider the corresponding findings as upper bounds to the true unobserved effects.

5.1 Empirical analysis: econometric strategy

Our empirical analysis follows a two-step procedure. First, for each class of internationalization, we estimate the probability of firm survival as a function of firm productivity, controlling for a wide set of firm- and sector-level characteristics considered at the 2007 value. In a second step, we calculate the so called "survival premia" (see Wagner 2011b) defined as the difference of the probability to survive between firms belonging to each of the classes under observation and firms included in the "only exporter" class, the simplest form of internationalization considered as a benchmark category.

In line with previous studies (see Greenaway et al. 2008, Wagner 2011b, Amendola et alii 2012) we use a nonlinear binary model. After excluding from the dataset all the firms that are present only in 2010, we build our dependent variable S_i ("survive") as a dummy that takes value 1 if the firm is present in our dataset both in 2007 and 2010, value 0 if the firm is present only in 2007.[5]

Among the explanatory variables we include labor productivity. We would expect a positive relationship between firm productivity and the probability of survival. From a theoretical point of

[5] In doing so, we have over 88.000 observations left for our analysis. These empirical models cannot be considered as models explaining the exit decision of the firms but they are used to infer differences in the exit probability of firms with different forms of international trade activities (Wagner, 2011b),

view, in some models looking at dynamics of industries with heterogeneous firms (Jovanovic 1982, Hopenhayn 1992), productivity differentials are crucial for entry and exit of firms. Output is a function of inputs and a random variable that models a firm specific productivity shock. These models assume that the stronger the shock at the time t, the higher is the probability of a further shock at t+1; firms will exit the market if this shock, for given prices of output and inputs, is above a critical value, and production is no longer profitable. From these models, it has been tested that firms that exit in year t, are in t-1 less productive than firms that survive in t. Farinas and Ruano (2005) and Wagner (2009) have verified this hypothesis for Spain and Germany, finding a positive relationship between productivity and probability of survival.

We include as regressors also the number of goods exported (imported) and the number of export (import) destination (origin) areas as proxies of product and markets diversification. Coeteris paribus, a sector- or country- specific demand shock would affect single-product firms more severely than multi-product ones. In fact these latter can reduce the risk by diversifying its sales (purchases) in terms of goods and/or different markets. Therefore, we would expect a positive relationship between product and market diversification and the probability of surviving.

Furthermore, we include firm's size (proxied by the number of employees) as regressor. Small firms usually show greater difficulty in achieving economies of scale and credit access. The size matters also in allowing firms to efficiently manage international activity, exports and so on. Moreover, higher restrictions on capital market lead to higher risk of insolvency and illiquidity, thus increasing the risk of failure. As a consequence we expect an increasing probability of survive associated to increasing size. In addition, our estimates include location dummies and a full set of industry to control for fixed effects across industries.

Our estimated equation is the following:

$$S^*_i = X'\beta + \varepsilon_i, \qquad (2)$$

where $\varepsilon \sim N(0, 1)$. Then S can be viewed as an indicator for whether this latent variable is positive:

$$\Pr(S = 1 \mid X) = \Pr(S^* > 0) = \Pr(X'\beta + \varepsilon) = \Pr(\varepsilon < X'\beta) = \Phi(X'\beta)$$

where X includes as covariates : the natural logarithm of firm-level labor productivity (valadd , proxied by the ratio between value added and the number of employee), the number of products sold or purchased by the firm in 2007 (prod_exp2007), the number of geographical areas (area_exp) of export (import) destination (origin), an ordered variable taking value 1 for firms up to 49 employees (small), 2 for firms from 50 to 99 employee (medium), 3 for firms with at least 100 employees (large), a variable indicating the geographical location of firm (region); an industry dummy calculated at the 2-digit level (Ateco); Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution.

For each class of internationalization equation (2) is estimated; firms in "foreign control" and "MNE" groups of Table 1 are collapsed in a unique class. In the case of only importing firms (intermediate and other goods), we include as a regressor the number of imported product and the areas of origin. For groups including firms involved in exporting and importing activity (global, two-way traders, foreign control/MNE), both regressors regarding both export and import activities are included.

5.2 Empirical analysis: results and comments

For each of the six class of internationalization, in Table 6 we reported results of estimated coefficient in equation (2). All the regressors are statistically significant and show the expected sign. As for labor productivity, a positive relationship between the initial level of productivity and the probability of firm survival is found for each class of internationalization; this is in line with previous evidence for other European countries.

Product differentiation is another important determinant of firm survival. As for exported goods, firms included in less advanced classes of internationalization ("only exporters" and "two-way traders") show higher probability to survive if they increase the varieties of goods exported. However, for global and multinational firms, this determinant is not statistically significant. As for import, goods diversification is relevant for "only importers"; the magnitude of the estimated coefficients is considerably higher compared to that of both "two-way traders" and "multinationals".

As well as for goods, also geographical diversification is an important determinant of the probability to survive. As above, the magnitude of the coefficient is higher for firms classified in the less advanced forms of internationalization.

As for firm size, two interesting results should be highlighted. First, especially for medium sized firms, the role of firm size on the probability to survive is higher in the "only importers" class (intermediate and other goods).[6] Second, in all classes, the magnitude of coefficient increases significantly in the case of large firms, thus confirming the finding that the probability of surviving increases with firms size.

Finally, our results show that firm localisation is not neutral with respect to probability of survival. In fact, the chances of survival are lower for firms located in the South compared to those located in the North-East, regardless of the form of internationalization.

Table 7 shows the "survival premia" estimated for each class of internationalization in the period 2007-2010, that is the difference with respect to the corresponding control group represented by firms with the lowest grade in the scale of internationalization ("only exporting"). All these differences are highly statistically significant. "Global" firms show the highest probability of survival, followed by the "two-way traders" and "importers of intermediate goods". Instead, "importers of other goods" present a probability of survival marginally lower. However, the exception is represented by the companies with the most evolved form of internationalization: multinational firms, including both Italian firms that have foreign subsidiaries ("MNE") and those controlled from abroad ("foreign control"). For this group, the estimated probability of survival is positive with respect to the control group, but its magnitude is only slightly lower compared to that estimated for the group of firms importing "intermediate goods".

This latter result seems to highlight the major role played by Italian "global" and "two-way traders" enterprises in preserving the national business cycle during the period of global financial crisis. As highlighted previously, Multinational companies show higher productivity (see Table 1), and they cover a wider range of products (see Table 3). These characteristics make multinational corporations more able to position in several markets, in particular when a country is hit hard by an adverse shock. Baldwin and Yan (2011) notice that multinational (in particular, foreign owner firms)

[6] In the case of size and region controls, the sign and the magnitude of the coefficients have to be interpreted as the difference respect to the reference category, respectively, (small firms and North-West).

are less rooted in the host country economy so that they can shift their activities to another country when local economy deteriorates.

Our results seem partially in line with previous findings for Italy. With respect to Amendola et alii (2012), we have to keep in mind that our results relates to the probability of survive in international markets, while their analyses focused on the exit from the Italian market. When we look at international activity, the exporter survival premium is relevant when firms export worldwide ("global"). As far as the MNE effect is concerned, we do find a significant survival premium with respect to the "only exporters" group.

Lower resilience of MNE can be compared with findings in Ferragina et alii (2012) where foreign multinationals are more likely to exit the market than national firms in manufacturing sectors; but these are related to the period 2004-2008, thus not including the effects of the financial turmoil.

6. Concluding remarks

This work lies in the wake of the recent empirical literature that has analyse the relationship between internationalization form and firm's performance. The analysis is carried out with a new database that covers the universe of Italian firms trading abroad; the observation period consists of two non-consecutive years (2007 and 2010), so that it includes the effects of the global financial crisis. Following the suggestions coming from literature, we present a taxonomy of classes of internationalization, ranging from the basic strategy (only exporting firms) to the more complex forms (internationalization of production).

Descriptive analysis shows that firms featuring more complex form of internationalization present larger and higher levels of productivity, as well as a more pronounced diversification of production measured in terms of the variety of exported goods. Indeed, the internationalization strategies of Italian firms changed during the period of the crisis in order to implement defensive strategies aimed at curbing the real effects of the recession. Over the period 2007-2010 firms changed their presence on foreign markets moving (on average) towards more complex forms of internationalization. These upwards shifts led to positive effects on both employment and value added growth.

The global crisis hit hard the Italian economy, forcing a large number of firms to exit from foreign markets. For this reason, it seems of interest to investigate the relationship between internationalization forms and firm survival probability.

According to our results, firm's productivity is a significant determinant of firm survival, despite the class of internationalization. Product and market differentiation, together with firms and sector characteristics, also matter to increase firm survival in period of crisis.

This "survival premia", however, is not equally distributed across the classes of our internationalization taxonomy: multinationals (at the top of our taxonomy) show a lower resilience during the crisis with respect to "global" or "two-way traders".

The issue of the potential growth of Italian firms associated with an increased degree of internationalization comes up again, especially in the current phase, as a issue central to the chances of recovery for Italian economy. The diversification of both products and markets, therefore, should be an objective to be pursued. To be "global" increases the likelihood to remain competitive, make profits and survive even in times of crisis.

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Table 1 - Forms of internationalization and firms' characteristics (2010)

Forms of internationalization	Number of firms	Number of employees	Average turnover *(thousands euros)*	Average size *(employees)*	Average productivity *(value added per employee)*	Average profitability *(Ebitda/value added)*	Average degree of openness *(Export/turnover)*
Foreign control	4,261	936,749	95,817	219.8	103.9	34.8	23.3
MNE	3,133	647,232	81,524	206.6	86.0	34.8	39.1
Global	10,467	933,482	29,853	89.2	65.5	35.4	47.8
two-way traders	28,176	992,827	12,375	35.2	62.7	40.3	20.9
importers of intermediate goods	13,608	412,095	10,758	30.3	60.9	43.6	0.0
importers of other goods/services	7,605	143,983	5,183	18.9	54.3	50.0	0.0
Only exporters	24,168	323,776	3,520	13.4	46.6	41.4	17.7
Total	**91,418**	**4,390,145**	**17,455**	**48.0**	**60.5**	**40.9**	**19.0**

Table 2- Forms of internationalization and firms' product diversification (2010)

Forms of internationalization	Product diversification					
	Number of sectors where the firms export	Number of sectors from which the firms import	Number of countries where the firms export	Number of countries from which the firms import	Number of exported goods	Number of imported goods
Foreign control	3.4	6.8	13.4	7.5	18.8	45.3
MNE	5.9	5.8	27.6	9.0	33.9	28.2
Global	4.5	3.8	29.6	6.0	24.6	16.0
two-way traders	2.5	3.3	6.2	4.1	8.9	13.3
importers of intermediate goods	0.0	3.3	0.0	2.8	0.0	12.6
importers of other goods/services	0.0	1.3	0.0	1.9	0.0	4.4
Only exporters	1.7	0.0	3.2	0.0	4.3	0.0
Total	2.1	2.6	7.7	3.2	8.7	11.2

Table 3 - Forms of internationalization and labour productivity by firm's size (value added per employee, 2010)

Forms of internationalization	Average size			
	1 - 49 employees	50 - 249 employees	250+ employees	Total
Foreign control	112.8	96.7	90.1	103.9
MNE	99.6	74.2	82.0	86.0
Global	63.8	69.0	73.4	65.5
two-way traders	62.4	64.4	71.8	62.7
importers of intermediate goods	60.2	69.6	76.2	60.9
importers of other goods/services	53.7	65.1	78.6	54.3
Only exporters	46.4	55.4	57.7	46.6
Total	**58.6**	**71.2**	**80.2**	**60.5**

Table 4 - Transition matrix: shifts in the forms of internationalization between 2007 and 2010 (number of firms and percentages)

Forms of internationalization (2007)	Forms of internationalization (2010)							
	Foreign control	MNE	Global	two-way traders	importers of intermediate goods	importers of other goods/services	Only exporters	Total
Foreign control	3,096	8	46	51	25	12	17	3,255
%	***95.1***	*0.3*	*1.4*	*1.6*	*0.8*	*0.4*	*0.5*	*100*
MNE	32	2,139	293	286	37	23	75	2,885
%	*1.1*	***74.1***	*10.2*	*9.9*	*1.3*	*0.8*	*2.6*	*100*
Global	99	322	6,789	1,439	6	3	523	9,181
%	*1.1*	*3.5*	***74.0***	*15.7*	*0.1*	*0.0*	*5.7*	*100*
two-way traders	136	248	1,332	12,932	1,169	423	1,725	17,965
%	*0.8*	*1.4*	*7.4*	***72.0***	*6.5*	*2.4*	*9.6*	*100*
importers of intermediate goods	53	35	14	1,963	4,058	409	231	6,763
%	*0.8*	*0.5*	*0.2*	*29.0*	***60.0***	*6.1*	*3.4*	*100*
importers of other goods/services	17	12	10	839	632	1,666	219	3,395
%	*0.5*	*0.4*	*0.3*	*24.7*	*18.6*	***49.1***	*6.5*	*100*
Only exporters	28	67	569	3,336	389	236	8,943	13,568
%	*0.2*	*0.5*	*4.2*	*24.6*	*2.9*	*1.7*	***65.9***	*100*
Total	3,461	2,831	9,053	20,846	6,316	2,772	11,733	57,012
%	*6.1*	*5.0*	*15.9*	*36.6*	*11.1*	*4.9*	*20.6*	*100*

Source: authors' calculations on ISTAT data

Table 5 – Effects of shifts and permanence in the forms of internationalization on firm's performance

Status		Effects on performance (marginal effects)			
		Employment		value addedd	
From (2007)	to (2010)	% Changes in employees		(% change)	
Only importer	**MNE**	0.21	***	0.28	***
Only exporter	**MNE**	0.13	***	0.10	*
Global	**MNE**	0.09	***	0.13	***
Only importer	**Global**	0.08	***	0.12	***
Only exporter	**Global**	0.07	***	0.08	***
Global	**Global**	0.06	***	0.06	***
MNE	**MNE**	0.05	***	0.08	***
Only exporter	**Only importer**	0.05	***	0.02	
MNE	**Global**	0.03	**	0.04	***
MNE	**Only importer**	0.02		0.06	
Only importer	**Only importer**	0.00		-0.01	**
Only importer	**Only exporter**	-0.02		-0.05	**
Only exporter	**Only exporter**	-0.04	***	-0.10	***
Global	**Only importer**	-0.05	***	-0.09	***
Global	**Only exporter**	-0.11	***	-0.18	***
MNE	**Only exporter**	-0.17	**	-0.13	*

Source: authors' calculations on ISTAT data

Table 6 - Probit estimates. Determinants of firms survival: Average Marginal effects.

	Only exporters	importers of other goods/services	importers of intermediate goods	two-way traders	Global	For.control/MNE
ln(valadd2007)i	0.072875***	0.058509***	0.06823***	0.063757***	0.048377***	0.06268***
	(0.004741)	(0.007096)	(0.006695)	(0.00512)	(0.009505)	(0.009619)
ln(prod_exp2007)i	0.071226***			0.005799*	-0.0112	0.001376
	(0.004181)			(0.003609)	(0.006015)	(0.00635)
ln(prod_imp2007)i		0.05322***	0.046873***	0.00962**	0.00961	0.012395**
		(0.007373)	(0.004617)	(0.003435)	(0.006465)	(0.006309)
ln(area_exp2007)i	0.065829***			0.024479***	0.026269***	0.02381***
	(0.004709)			(0.003939)	(0.008793)	(0.006912)
ln(area_imp2007)i		0.095408***	0.084912***	0.030445***	0.006449	0.000808
		(0.011271)	(0.007821)	(0.005077)	(0.008387)	(0.009476)
(size2007)i class2	0.057591***	0.09236***	0.08045***	0.020229**	0.00528	0.078679***
	(0.015321)	(0.028992)	(0.019738)	(0.009454)	(0.010851)	(0.014118)
(size2007)i class3	0.211135***	0.191808**	0.189113***	0.190612***	0.099181***	0.181205***
	(0.05822)	(0.064099)	(0.038723)	(0.019253)	(0.019172)	(0.016296)
(region)i North-East	-0.01735	-0.00977	0.007566	-0.02315***	-0.02013**	-0.0132
	(0.007116)	(0.014819)	(0.010975)	(0.006732)	(0.009647)	(0.012102)
(region)i CENTRE	-0.05336***	-0.07139***	-0.04128***	-0.05735***	-0.04284***	-0.01609
	(0.008085)	(0.01457)	(0.012194)	(0.008232)	(0.012147)	(0.016496)
(Ateco)i SOUTH	-0.1387***	-0.12525***	-0.11605***	-0.10874***	-0.08839***	-0.06352***
	(0.009263)	(0.014685)	(0.012976)	(0.010414)	(0.020977)	(0.028638)
n.obs.	27411	7808	11884	25720	9611	5998
Log pseudolikelihood	-17265.632	-4858.8894	-7385.801	-15075.334	-4806.5714	-2884.5316

Source: authors' calculations on ISTAT data

Notes: Standard errors in parenthesis. The reference category for class is represented by smaller firms (class1), for region by Nort-West. Sign and magnitude of class and region coefficients are reported as a difference with respect the reference category. *** = statistically significant at 1%; ** = statistically significant at 5%; *= statistically significant at 10%. All models include a constant term plus a full set of 2-digit level industry dummy variables (NACE Rev.2)

Table 7 –Survival Premia.
(Estimated probability of survive for firms with different form of internationalization. Differences with respect to the "only exporters" group.)

	difference	s.e.	t
Foreign control/MNE	0.045394	0.002901	15.6482
Global	0.284511	0.001272	223.6065
two-way traders	0.203351	0.001232	165.0607
importers of intermediate goods	0.072706	0.001878	38.7159
importers of other goods/services	-0.06141	0.002183	-28.1331

Note: the estimated probability of survive is based on estimates of model (2).